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ABSTRACT

Data collected from 144 school districts in 47 states indicate significant increases during the past 5 years in both administrative and instructional uses of the computer. School systems are also introducing programs in computer literacy for both teachers and students. The following recommendations are made for teacher education in computer use: (1) Planning for the instructional use of computers must incorporate both time and assistance for teachers so that they can become computer literate; (2) Teachers and administrators should be involved in the selection and purchasing of instructional software; (3) Media and guidance personnel need to be aware of potential uses in their areas such as career guidance, testing, scoring, and record keeping; (4) Instruction for teachers should include selecting appropriate instructional material, making use of the computer to stimulate higher order thinking, and making use of the computer as an instructional manager; and (5) Computer literacy for administrators should include report generating, parent communication, master scheduling, word processing, and selection and purchasing of appropriate hardware and software. (JD)

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ADVANCES MADE TOWARD COMPUTER LITERACY

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SP 023 626

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ABSTRACT

Data collected from a questionnaire distributed to 144 school districts from 47 states indicate significant increases during the past five years in both administrative and instructional use of the computer. School systems are also introducing programs in computer literacy for both teachers and students. Several recommendations are made that have implications for teacher education.

SP 023 626

Introduction

The computer is developing into an integral part of public education. Most educators are aware of its use in the administration phase of schools. However, within the last ten years significant advancements have been made to bring the computer into a demonstration and dissemination phase of instruction.

To what extent are computers being employed in public schools? Are they used for administrative purposes? For instructional purposes? Both? Answers to these questions should be both interesting and useful now that the computer has been around for more than a decade and is here to stay. To determine the status of computers in public school settings the study reported here was conducted.

Procedures

A random sample of three school districts was chosen from each state. School districts with over 10,000 pupils constituted one population, school districts with less than 10,000 pupils constituted a second population, and all school districts in the state constituted a third population. One district from each population was randomly selected for this study.

An initial letter was sent to the superintendent of each school district chosen to determine the person most knowledgeable about computer services for the school district.

A questionnaire developed to determine the extent to which the computer is used for administrative purposes as well as instructional purposes was sent to that person. The instrument was distributed to 144 school districts representing 47 states. Ninety eight questionnaires were returned (86%).

Results

Data collected from the questionnaire indicate significant increases during the past five years in both administrative and instructional uses of the

computer. Forty five percent of the school districts responding indicated that initial purchase of computers for administrative purposes occurred between 1976 and 1982, while sixty three percent during the same time span initially bought computers for instructional purposes. The number of computers presently in use for administrational and instructional purposes are shown in Table I.

Table I

Computers in Use

Administrative Use %	No Answer	0-5	6-10	10-25	25+	26-100	100+
	1	53	13	15	17	0	0
Instructional Use %	No Answer	0-5	6-10	10-25	25+	26-100	100+
	1	10	9	20		28	0

In addition, information was gathered to determine in what ways computers were used for administrative and instructional purposes. The following Tables indicate how public schools are using the computer. The numbers indicate the percent of schools reporting the use of each activity.

Table II

Administrative Uses

86%	Accounting
84%	Payroll
83%	Scheduling
79%	Grades
73%	Employee Records
66%	Attendance
65%	Student Records
52%	Planning

Table III

Library Applications

18%	Management of holdings
15%	Search system
13%	Keeping usage statistics
10%	Control of library loans
8%	Inter-library loans system

Table IV

Guidance and Special Services Application

48%	Scoring Standardized Tests
41%	Interpreting test results
30%	Diagnosis and Remediation
18%	Computer administered tests

Table V

Classroom Applications

90%	As an instructional aid
54%	As an aid in instructional management
48%	Student record keeping by instructor
19%	Selecting appropriate material for instructional purposes

Table VI

Computer Assisted Instruction

85%	Drill
77%	Tutorial
71%	Simulation

Of equal interest is information concerning computer awareness and literacy in public schools. Computer awareness and literacy includes such areas as: How computers are used, What a computer can and cannot do, What a program can and cannot do, How computers work, and Impact of computers on society. Respondents were asked to check programs currently in use in their district to increase student and/or teacher knowledge. Table (VIII) indicates the current percentage of schools with programs for teachers and students in computer awareness and literacy.

Table VII

Programs for Computer Awareness and Literacy for Teachers & Students

Teacher	Student	
77%	84%	How computers are used
73%	80%	What a computer can and cannot do
65%	76%	What a program can and cannot do
61%	76%	How computers work
61%	69%	Impact of computers on society

Interpretations

These data indicate initially that computers are used primarily for administrative use when there are few computers in the school. As the number of computers increase, instructional use increases. This would seem to indicate that the computer is considered by the educational community to be more appropriately used for administrative rather than instructional purposes. In addition, the administrative uses of computers (Table II) have been most popular in areas where the computer was useful in business. For example, the two most popular uses administratively are accounting and payroll, both of which are areas where software was first introduced in the business community. However, five of the next six areas of use indicates the growing popularity of computers in areas specific to education. Of special significance, over fifty percent of the administrators reported using the computer in areas of planning. This suggests a growing flexibility on the part of administrators in developing creative and beneficial uses for the computer.

Tables III and IV suggest a limited administrative use of the computer in areas such as library, guidance, and special services application. It appears that these could be rapid growth areas for the use of computers in schools.

In classroom applications, the overwhelming use of the computer is as an instructional aid. This could be the result of a number of factors. For example,

a lack of knowledge on the part of the instructors on how to use the computer in ways other than as an aid and also the lack of commercially produced quality software in other areas. It is encouraging, however, that over half of the schools reporting classroom applications of the computer use it as an aid in instructional management. One might surmise that the computer may have passed the instructional television phase of twenty years ago in its incorporation into the instruction process. As curriculum material classification systems, such as the Anhurst Curriculum Classification System (ACCS)[1](footnote), become popular and additional material is classified and computerized, teachers will find that selecting appropriate materials for individualized instruction will be simplified by the computer.

It is evident from data in Table VI that the most frequent use of the computer for student instruction is drill. For instructional purposes, there seems to be general agreement within the educational community that simulation and tutorial instruction are more effective than drill in promoting higher levels of thinking. This high percentage of drill may indicate the need for improved software in the area of instructional use.

Also of interest were data collected concerning programs used to develop particular aspects of the computer for teachers and students. (Table VII) Consistently, a higher percentage of programs are being used with students as opposed to teachers. This seems to be placing the proverbial "cart before the horse" in computer competency. This may be one of the major drawbacks to the continued use and updating of computers in schools. If teachers are not properly oriented in computer capabilities, it would seem unlikely that computer use would increase in sophistication and understanding.

Today more than half of the jobs in the nation are in the information industry. A study carried out by the U. S. Department of Labor Statistics shows that of the ten fastest growing jobs during the 1980's, three out of the top five are in the computer industry. Over three-fourths of today's kindergarten

students will one day be employed in occupations requiring computer literacy.[2]

Recommendations

Collectively, the data reveal both strengths and weaknesses we may present in the use of computers in schools. The following recommendations generated from the data may, if implemented, reduce some areas of weakness and strengthen many general areas of computer use.

1. Planning for the instructional use of computers must incorporate both time and assistance for teachers so they can become computer literate.
2. Teachers and administrators should be involved in the selection and purchasing of instructional software.
3. Media and guidance personnel need to be made aware of potential uses in their areas such as career guidance, testing, scoring, and record keeping.
4. Additional computer literacy instruction for teachers should include such topics as selecting appropriate instructional material, making use of the computer to stimulate higher order thinking, and making use of the computer as an instructional manager.
5. Computer literacy for building administrators should include areas such as:
    a. report generating,
    b. parent communication
    c. master scheduling
    d. word processing
    e. selection and purchasing of appropriate hardware and software

[1]Frymier, Jack, Annehurst Curriculum Classification System A Practical Way To Individualize Instruction, Kappa Delta Pi Press, West Lafayette, Indiana, 1977

[2]Grady, M. Tim, and Jane D. Gawronski (Ed.), Computers in Curriculum and Instruction, Association for Supervision and Curriculum Development 1983, p.2